

Tues 4th May 2021

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

Current estimate of Rt (new positive tests): 0.70 – 1.05 (7 days previous 0.70 – 1.05)

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

Average number of new positive tests per day last 7 days: 93 (7 days previous 99)

7 day incidence based on new positive tests: 34 / 100k (7 days previous 37)

14 day incidence based on new positive tests: 72 / 100k (7 days previous 78)

7 day average of total positive individuals (pillar 1 and 2): 1.1% (7 days previous 1.1%)

7 day daily average tests completed: 10,096 (7 days previous 10,292)

Number of new positive tests in over 60s in last 7 days: 58 (7 days previous 73)

Proportion of total positive tests occurring in over 60s: 9.2% (7 days previous 10.5%)

First COVID-19 +ve hospital admission in last week: 23 (7 days previous 24)

Number of community acquired COVID-19 inpatients: 44 (7 days previous 38)

COVID-19 +ve ICU patients: 7 (7 days previous 5)

There has been a small decrease in the daily average of new positive cases over the past week, with the exception of Derry and Strabane which is at a much higher level than other LGDs. Percentage of positive tests and Rt for cases are stable. Hospital admissions remain at a very low level, so it is no longer possible to provide an accurate value for Rt based on admissions. There has been a modest increase in COVID inpatients but numbers remain at a low level. It is too early as yet to see any impact of recent relaxations.

Results from several different sources of genomic data suggest that the B.1.1.7 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. There is no evidence that other significant variants have become established in NI at present.

Tues 4th May 2021

During the most recent week of the ONS Survey (week ending 24th April), it was estimated that 1,900 people had COVID-19 (95% credible interval: 600 to 4,100). This equates to 0.11% (95% credible interval: 0.03% to 0.22%) of the population in Northern Ireland or around 1 in 940 people (95% credible interval: 1 in 350 to 1 in 1,640). This is compared to the other countries of the UK below.

Area	Estimated average % of the population that had COVID-19 (95% CI)	One person in
England	0.10 (0.08-0.12)	1010
Northern Ireland	0.11 (0.03-0.22)	940
Scotland	0.16 (0.09-0.25)	640
Wales	0.06 (0.02-0.14)	1570

Regional variation in cases

Incidence per LGD is shown over the last week in the table below. Cases in Derry City and Strabane remain much higher than in the rest of NI and are increasing. Cases in neighbouring parts of Donegal are at an even higher level. Work is ongoing to understand and address relevant factors

Tues 4th May 2021

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

26th April	27th April	28th April	29th April	30th April	1st May	2nd May	3rd May	LGD
32	34	33	41				44	Antrim and Newtownabbey
9	9	6	5				4	Ards and North Down
21	17	15	17				14	Armagh City, Banbridge and Craigavon
33	32	28	28				21	Belfast
31	36	34	34				32	Causeway Coast and Glens
68	60	69	80				103	Derry City and Strabane
54	54	51	48				40	Fermanagh and Omagh
17	15	17	16				21	Lisburn and Castlereagh
29	29	31	30				28	Mid and East Antrim
73	70	68	68				43	Mid Ulster
32	29	24	28				38	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.

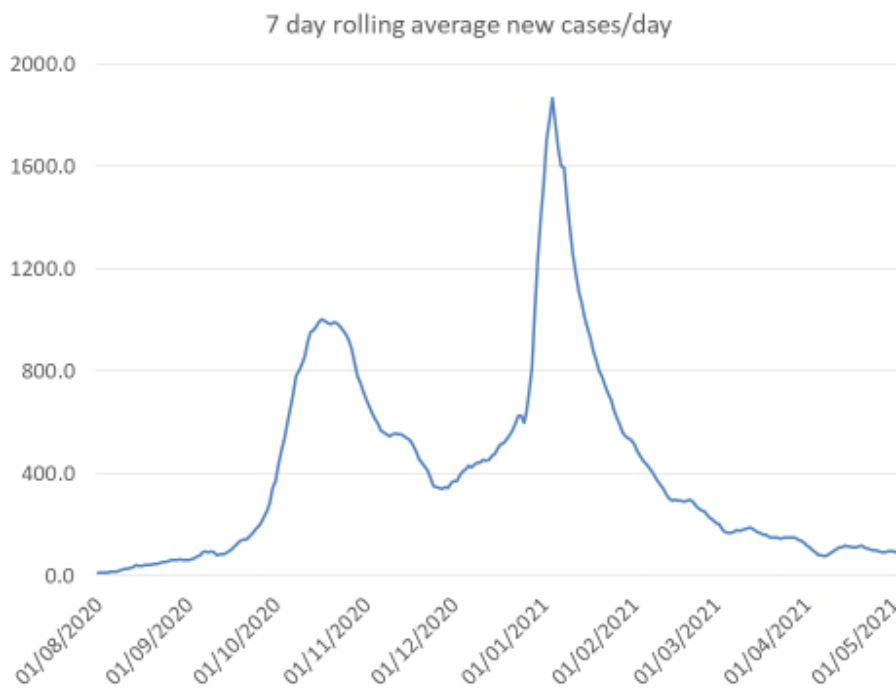
Tues 4th May 2021

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.

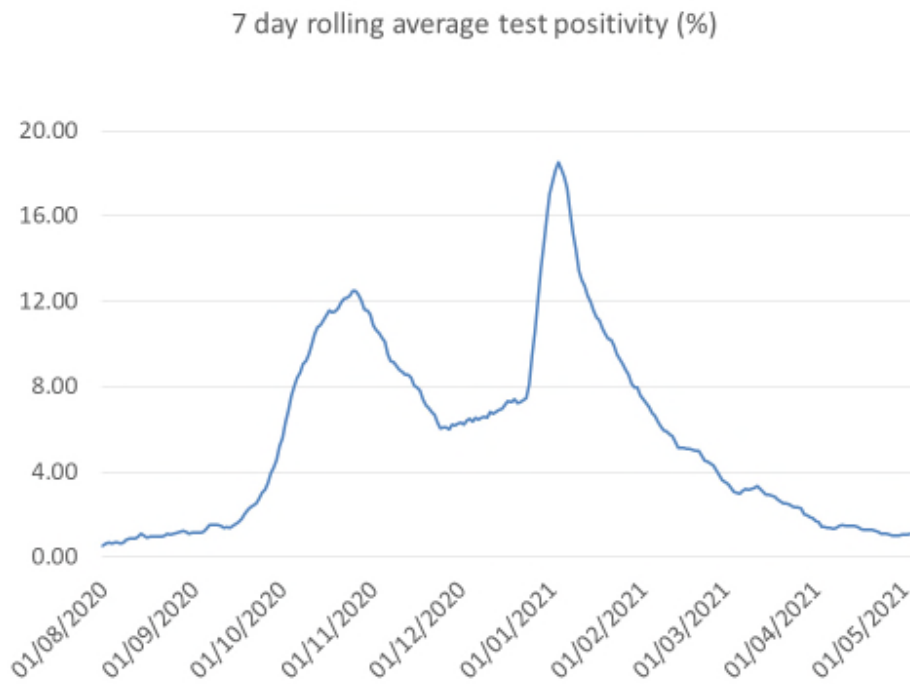
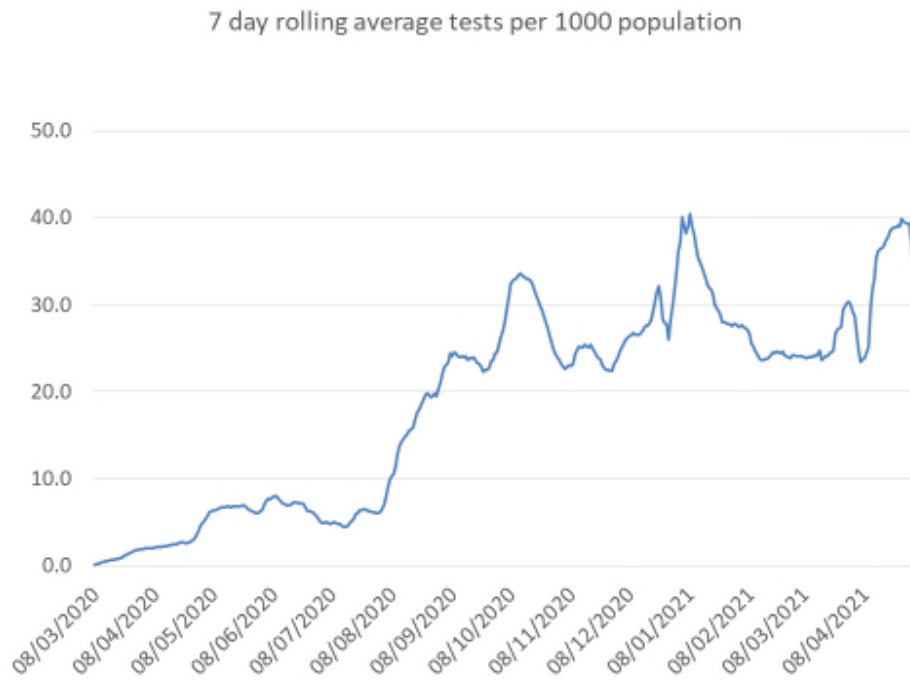
Trends for Northern Ireland

The value of R_t is 0.70 – 1.05 for cases. Due to increasing uncertainty with smaller numbers, the R_t estimate for admissions or ICU are not reported this week.

The graphs below show that the number of new COVID 19-cases has declined slowly in the last week, with test positivity stable.



Tues 4th May 2021

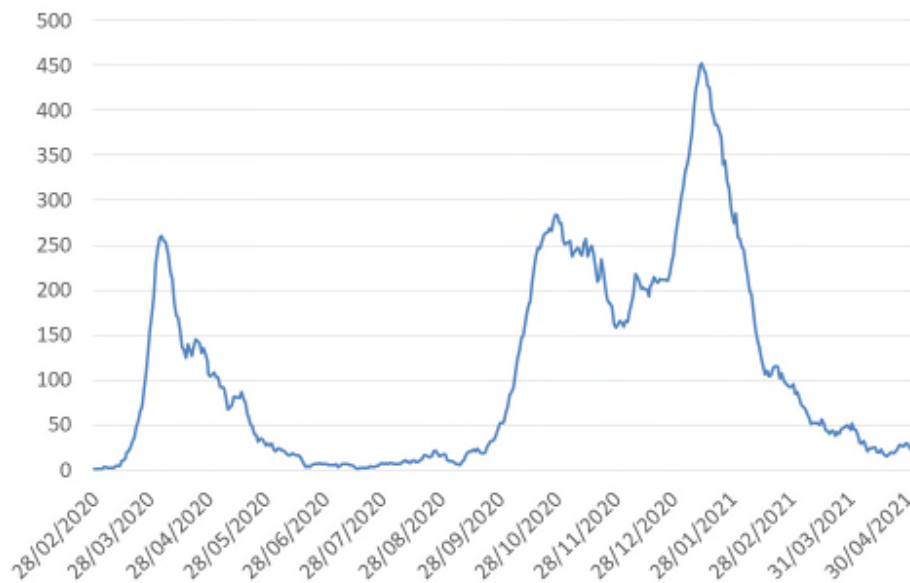


The following graphs show first hospital admission of COVID positive patients over a rolling 7-day period and the number of hospital inpatients. Admissions have declined

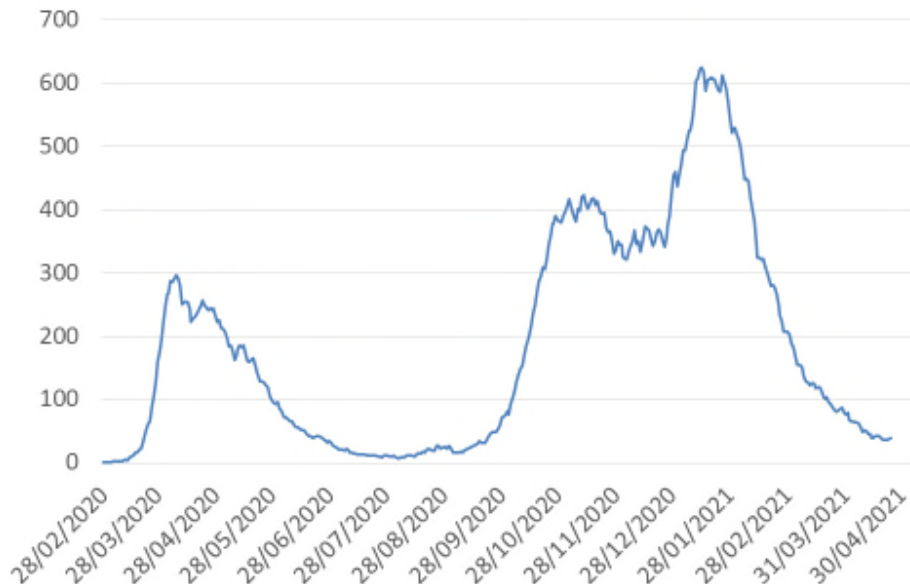
Tues 4th May 2021

slightly in the last week, while total occupancy and ICU occupancy have risen somewhat but remain at a low level. In hospital deaths are currently very low.

7 day rolling total first COVID +ve hospital admission

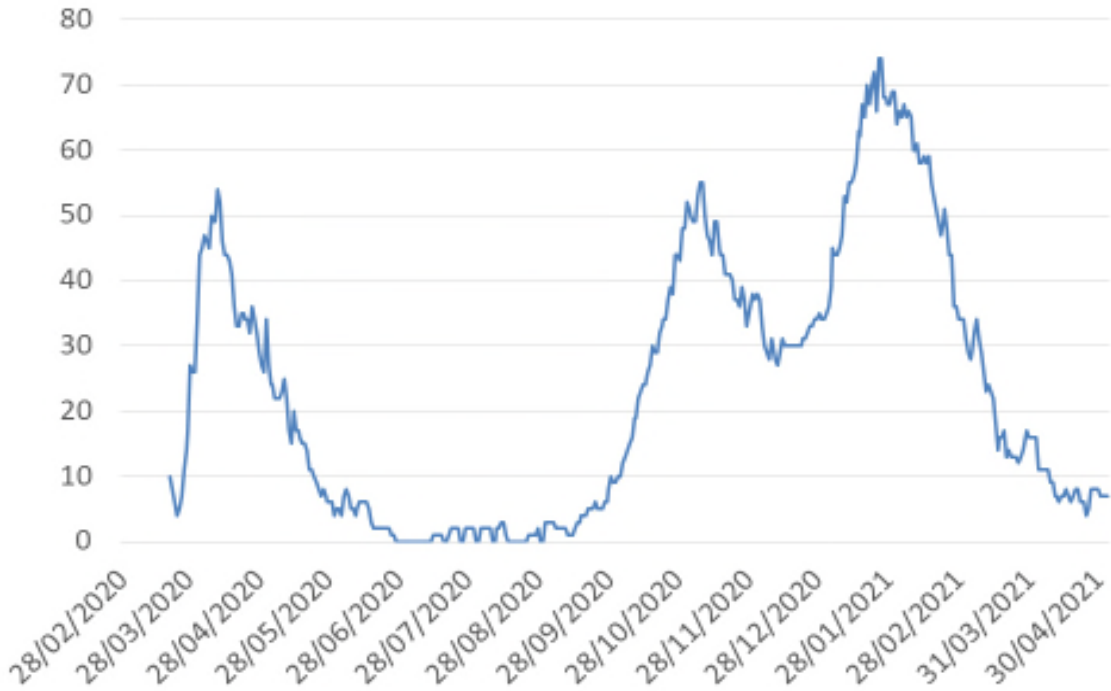


COVID +ve community acquired inpatients

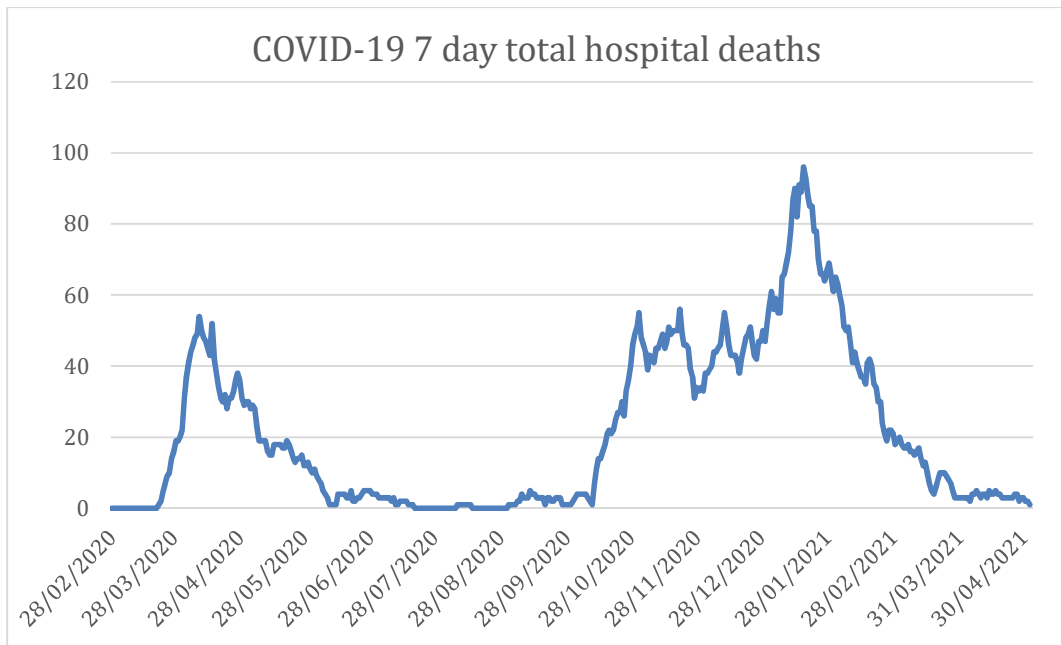


Tues 4th May 2021

COVID +ve patients in ICU



COVID-19 7 day total hospital deaths



Tues 4th May 2021

NI, UK and Republic of Ireland comparison

Numbers are currently changing across the Common Travel Area. NI has a higher incidence than the other countries of the UK, and a lower incidence than ROI based on dashboard figures published by relevant Governments. These numbers do not take into account different testing strategies in different countries.

