Tues 31st August 2021

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

Current estimate of Rt (new positive tests): 0.9 - 1.1 (7 days previous 1.05-1.25)

Current estimate of Rt (hospital admissions): 0.95 – 1.15 (7 days previous 0.90-1.10)

Average number of new positive tests per day last 7 days: 1586 (7 days previous 1720)

7 day incidence based on new positive tests: 585 / 100k (7 days previous 634)

14 day incidence based on new positive tests: 1214 / 100k (7 days previous 1150)

7 day average of total positive individuals (pillar 1/2): 10.1% (7 days previous 9.4%)

7 day daily average tests completed: 17,835 (7 days previous 16,086)

Number of new positive tests in over 60s in last 7 days: 1342 (8 days previous 1434)

Proportion of total positive tests occurring in over 60s: 12.6% (9 days previous 11.9%)

COVID-19 +ve hospital admission in last week: 298 (7 days previous 278)

Number of COVID-19 inpatients: 362 (7 days previous 339)

COVID-19 +ve ICU patients: 42 (7 days previous 43)

The number of new positive cases has begun to decline in the last few days, suggesting that we are beyond the anticipated mid/late August peak. The percentage of positive tests has also fallen. Hospital admissions along with occupancy have risen modestly, but should be around peak and will fall modestly in line with cases. ICU occupancy and deaths remain steady.

Cases remain highest in the 18-30 age-band but are falling in all age bands except 0-11s. Rt for cases is around 1 and falling, and Rt for admissions is slightly above 1.

The conversion rate of cases to hospital admissions with a lag of 8 days has fallen to 2.0%.

In terms of modelling, an increase in cases is expected following the return of schools, and this will be followed by an increase in hospital admissions. The

impact of schools opening and relaxations has been dramatic in Scotland, where prevalence now exceeds that in NI.

The delta variant in NI accounts for over 90% of all cases and is the dominant variant. The remainder of cases are almost all alpha variant. There is no evidence that other significant variants are established in NI at present.

During the most recent week of the ONS Survey (week ending 20th August), it was estimated that 43,300 people had COVID-19 (95% credible interval: 33,600 to 53,900). This equates to 2.36% (95% credible interval: 1.83% to 2.94%) of the population in Northern Ireland or around 1 in 40 people (95% credible interval: 1 in 35 to 1 in 55). This is compared to the other countries of the UK below.

ONS COVID-19 Infection Survey

Week up to 20th August

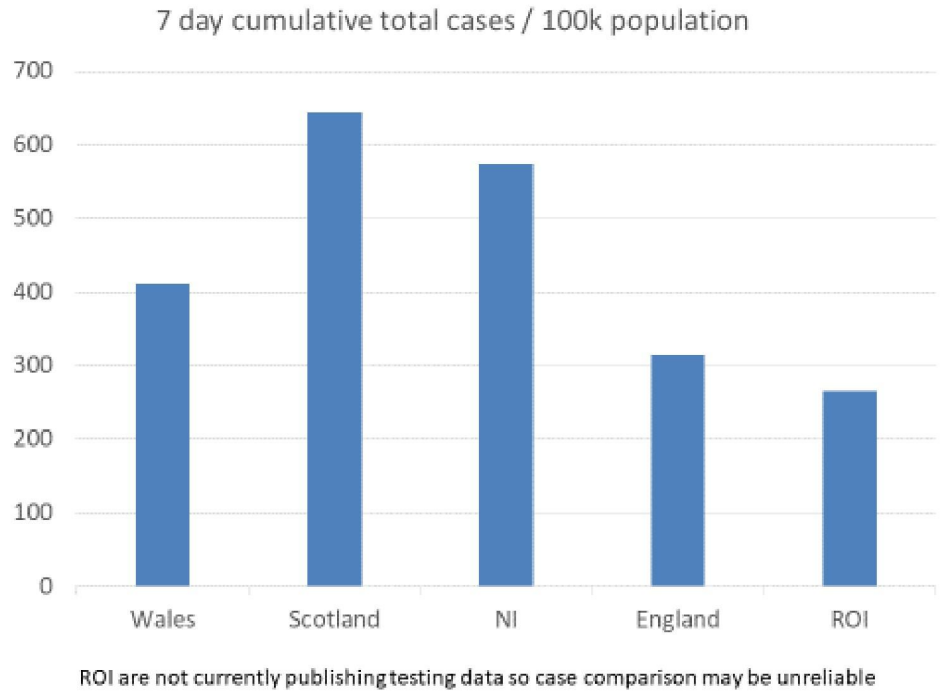
Country	Estimated average % of the population that had COVID-19	95% credible interval		Estimated average number of people testing positive for COVID-19	95% credible interval		Estimated average ratio of the population that had COVID-19	95% credible interval	
		Lower	Upper		Lower	Upper		Lower	Upper
England	1.39	1.30	1.48	756,900	710,100	806,200	1 in 70	1 in 75	1 in 70
Wales	0.83	0.59	1.10	25,200	18,000	33,500	1 in 120	1 in 170	1 in 90
Northern Ireland	2.36	1.83	2.94	43,300	33,600	53,900	1 in 40	1 in 55	1 in 35
Scotland	0.70	0.53	0.90	36,700	27,600	47,200	1 in 140	1 in 190	1 in 110

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

NI, UK and Republic of Ireland comparison

In terms of cases reported, Scotland now has the highest incidence across the CTA, based on dashboard figures published by relevant Governments. Of note, the trajectory of cases in Scotland and Wales is strongly upwards. ROI is no longer publishing test

numbers or positivity so a direct comparison with NI and other parts of the UK may be misleading.



Regional variation in cases

Incidence per LGD is shown over the last week in the table below. Fermanagh and Omagh and Derry and Strabane continue to have the highest incidence but are falling, with a pattern indicating widespread community transmission in a variety of settings. Overall, 9 of 11 LGDs show a decrease in cases in the last week.

Tues 31st August 2021

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

24th August	25th August	26th August	27th August	28th August	29th August	30th August	31st August	LGD
514	497	500	498	472	463	440	425	Antrim and Newtownabbey
374	357	375	393	391	403	398	396	Ards and North Down
682	663	637	608	595	604	562	593	Armagh City, Banbridge and Craigavon
606	599	590	580	576	568	551	530	Belfast
492	489	487	476	461	469	480	467	Causeway Coast and Glens
990	949	962	940	924	890	834	770	Derry City and Strabane
994	1003	1044	1032	982	989	931	865	Fermanagh and Omagh
426	416	429	437	440	456	432	444	Lisburn and Castlereagh
599	575	581	594	583	560	541	547	Mid and East Antrim
626	618	582	549	521	510	473	452	Mid Ulster
578	557	579	559	528	537	522	511	Newry, Mourne and Down

Determining the value of Rt

The most common approach to determining Rt 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.

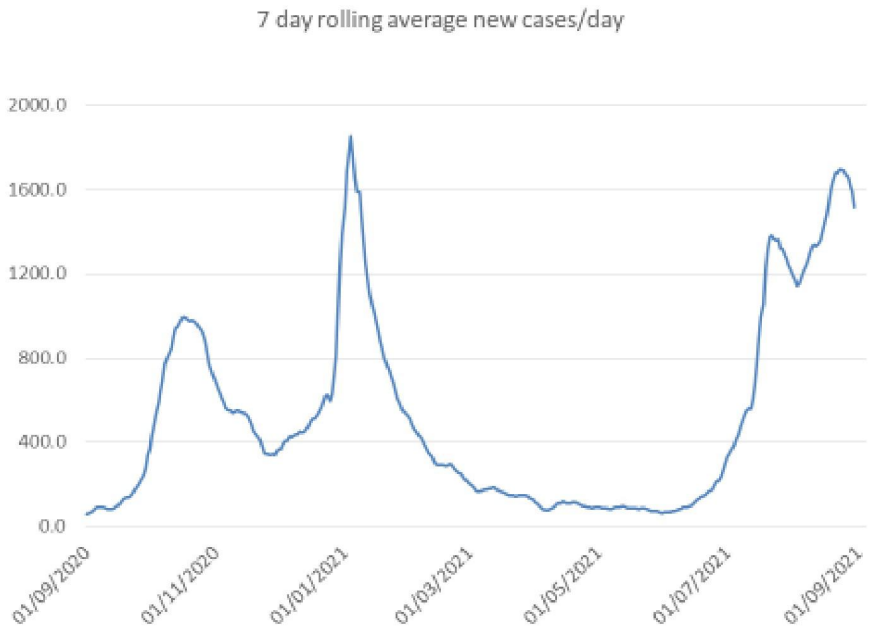
In addition to the impact of the mathematical model used, the calculated value of Rt is also influenced by the choice of input variable. Rt calculated for new COVID-19 cases will not be the same as Rt calculated for hospital admissions, or ICU occupancy, or deaths. There may be a significant lag (2-3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

The modelling group determines Rt each day using a bespoke Northern Ireland SIR model. As its primary input the group uses hospital in-patient admissions with

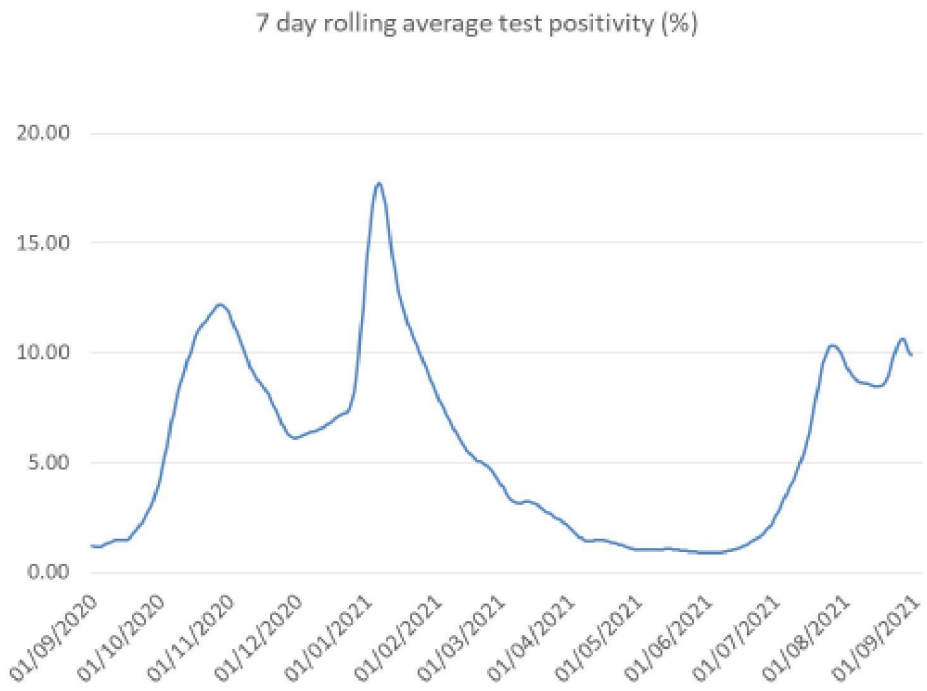
community-acquired COVID-19, but also uses a range of other inputs. We therefore have several different values for Rt each day, each of which has a midpoint value and a lower and upper boundary (95% confidence intervals). In addition a number of academic groups, both in the UK and ROI, model the COVID-19 epidemic and we have access to their estimates of Rt for Northern Ireland. Rt 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

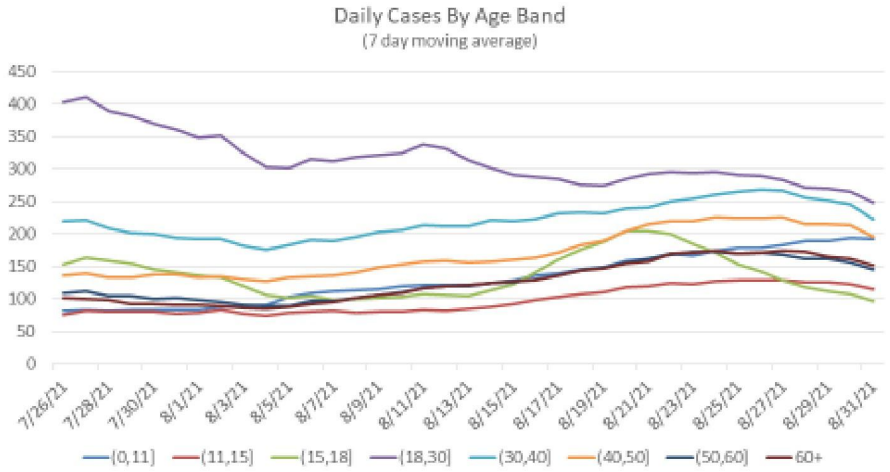
The value of Rt for cases is around 1 (0.9 – 1.1) and Rt for admissions is in the range 0.95 – 1.15.



Tues 31st August 2021

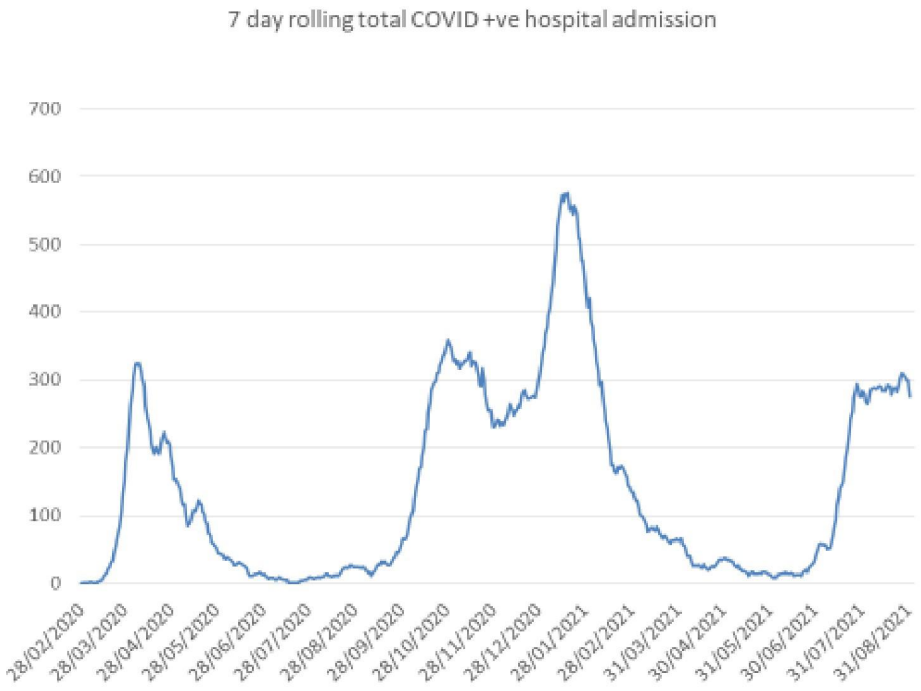


As discussed above, cases remain highest in the 18 – 30 group but are falling in all other age bands except 0 - 11. It is too early to see the impact of return of schools.

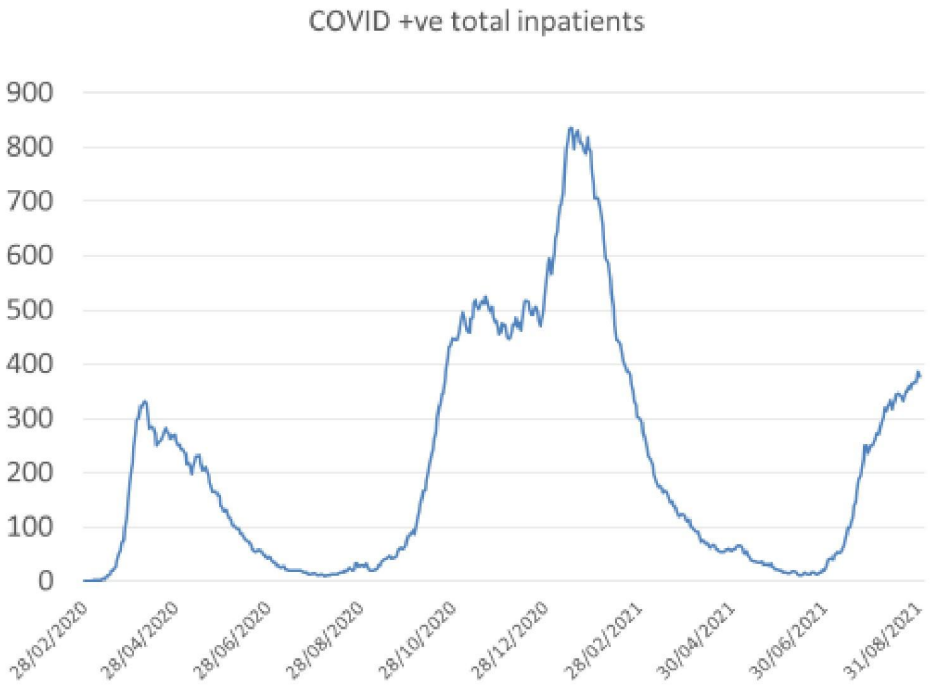


Tues 31st August 2021

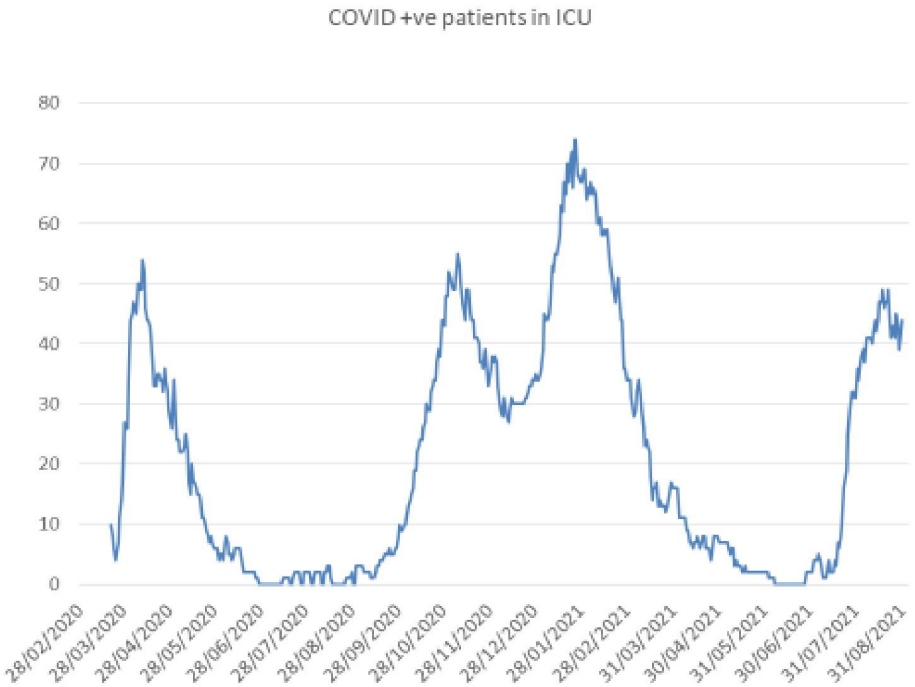
The following graphs show hospital admissions of COVID positive patients over a rolling 7-day period and the number of hospital inpatients. Admissions and inpatient numbers are steady or rising slowly.



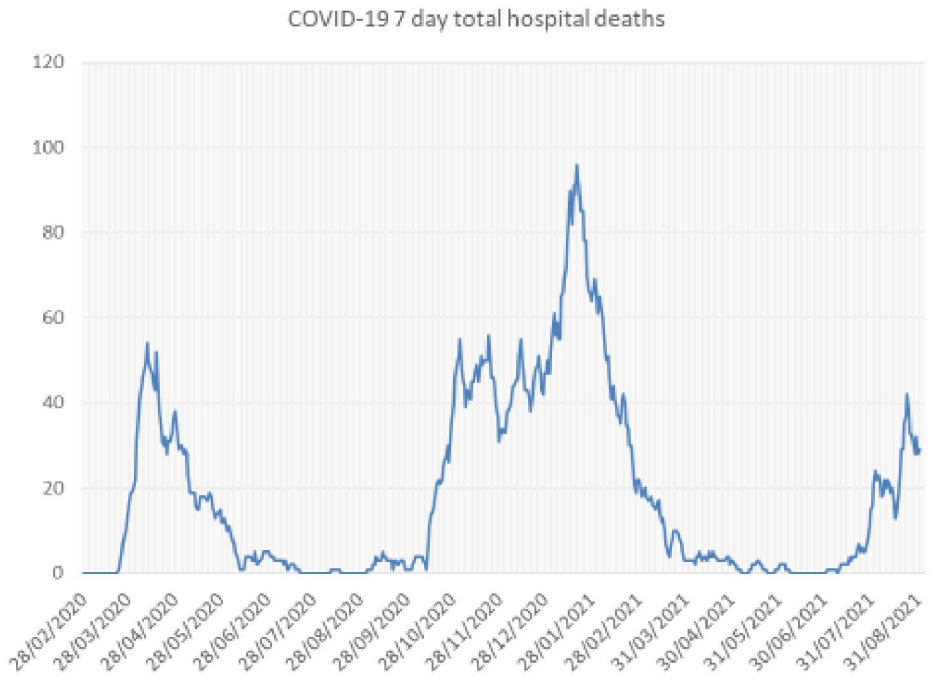
Tues 31st August 2021



ICU occupancy and deaths in hospital are roughly steady.



Tues 31st August 2021



Update on modelling:

At present we have passed the anticipated mid-late August peak for cases and should be near peak for hospital bed occupancy. However, a further increase in both is anticipated following the return of schools and Universities in September.

Variants of concern:

We continue to monitor COVID variants using a combination of Whole Genome Sequencing and reflex PCR tests where appropriate. Reflex testing indicates that over 98% of cases are currently delta variant.

The current assessment is that delta variant is likely to be 40-60% more transmissible than alpha variant, and to be associated with a 1.7x increased risk of hospital admission. Two doses of any approved vaccine are highly effective against serious illness following delta variant.

Tues 31st August 2021

Vaccine uptake:

87.1% of the NI adult population have received a first dose of a vaccine and 39.5% of 16-17 year olds.